JOINT INTEROPERABILITY ENGINEERING ORGANIZATION

Software Product Specification SPS 2-96

10 April 1996

SOFTWARE PRODUCT SPECIFICATION

FOR THE

STATUS OF RESOURCES AND TRAINING SYSTEM (SORTS)

RELEASED BY:

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Requests for this document must be referred to:

THE COMMANDER JIEO

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ACKNOWLEDGMENT

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general direction of the SORTS Project Manager (JEXAA) and the
Chief, Applications Engineering Facility (JEXA).

CONTENTS

ABSTRACT

This Software Product Specification (SPS) establishes the Product
Baseline (PBL) for Version 6.2 of the Status of Resources and
Training System (SORTS)--which incorporates Version 2.0 of Global
SORTS (GSORTS). The PBL for SORTS is established for, and
releasable on: 1) a Sun Scalable Processing Architecture (SPARC)
platform using the Solaris 2.3 operating system and 2) a
Macintosh-based Worldwide Military Command and Control System
(WWMCCS) Information Systems (WIS) Workstation using the Ap-
ple/Unix (A/UX) 3C operating system.

The SPS references the executable software, source files, and
software support information for SORTS. Reference to the "as
built" design information and compilation/build procedures is
also provided. The modification procedures are either contained
within this specification or reference is provided to where they
may be found. This specification is the primary software support
document for SORTS v6.2/GSORTS v2.0.

The SPS is divided into two major areas: requirements (Section 3)
and software support information (Section 5).

This specification supersedes the <u>Software Product Specification
for the Global Command and Control System (GCCS) Status of
Resources and Training System (GSORTS)</u>, Version 1.2, JIEO SPS 2-
95 (Revised), 30 Jun 95.

SECTION 1. SCOPE

The following sections define the scope of the Software Product
Specification (SPS) by identifying the system and the subsystems
that comprise it, discussing the system's purpose and presenting
an introduction to the rest of the document.

1.1 <u>Identification</u>

This SPS specifies Version 6.2 of the Status of Resources and
Training System (SORTS)--which incorporates Version 2.0 of Global
SORTS (GSORTS). SORTS has four logical subsystems:

     a. User Interface

     b. Database Processing

     c. Application Interfaces

     d. System Utilities.

1.2 <u>System Overview</u>

The Status of Resources and Training System (SORTS) is an infor-
mation management system within the Department of Defense (DoD).
SORTS provides the National Command Authorities (NCA) and the
Joint Staff with authoritative information on the identification,
location, resources, and readiness of U.S. Armed Forces units.
It is the single system that provides unit monitoring information
to the National Military Command System (NMCS). SORTS provides
information to the Joint Staff and combatant commands necessary
for the command and control of U.S. military units in all
operational environments.

SORTS v6.2 is a workstation-based application that provides
access to the SORTS database. Both the application software and
the database reside and operate on the Worldwide Military Command
and Control System (WWMCCS) Information Systems (WIS) Workstation
(WWS)--also known as the Honeywell Macintosh IIfx. The SORTS
application provides a highly flexible system architecture that
allows for fast, effective data updates but minimizes contentions
for system resources. Within this architecture, individual
software components are distributed--thus removing the resource
bottlenecks and inflexible design found in the older Worldwide

Military Command and Control System (WWMCCS) mainframe-based system.

GSORTS v2.0 is a mission application of the Global Command and Control System (GCCS) that provides access to SORTS data. The GSORTS application provides a highly flexible system architecture that allows for fast, effective data updates but minimizes contentions for system resources. Within this architecture, individual software components are distributed as segments on a database server and multiple application servers.

In addition, there are powerful and effective software applications allowing ease of data entry, while providing complete and accurate validation capabilities. The end result is a more responsive system which enhances the utility of the data contained within the SORTS database.

1.3 Document Overview

This SPS references the executable software, source files, and software support information for SORTS. Reference to the "as built" design information and compilation/build procedures is also provided. The modification procedures are either contained within this specification or reference is provided to where they may be found. The SPS is the primary software support document for Version 6.2 of SORTS (including Version 2.0 of GSORTS).

SECTION 2. REFERENCED DOCUMENTS

The following references were used in preparation of this SPS:

    a. Chairman of the Joint Chiefs of Staff (CJCS), <u>Release
        Procedures for Joint Staff and Joint Papers and Informa-
        tion</u>, CJCS Instruction (CJCSI) 5714.01, Washington, DC,
        29 Apr 94

    b. CJCS, <u>Status of Resources and Training System (SORTS)</u>,
        Memorandum of Policy (MOP) 11, Washington, DC, 16 Mar 90;
        Change 1, 24 Dec 92

    c. Defense Systems Support Organization (DSSO), <u>Documenta-
        tion Standards and Publications Style Manual</u>, Procedures
        Manual (PM) 1-91, Washington, DC, 1 Jun 91

    d. DSSO, <u>Procedures and Guidelines for Software Testing</u>,
        Procedures Manual (PM) 5-91, Washington, DC, 1 Oct 91
        (draft)

    e. DSSO, <u>Standards and Procedures for Software Projects</u>,
        Procedures Manual (PM) 2-92, Washington, DC, 27 Feb 92

    f. DSSO, <u>SORTS Administrator Guide</u>, Technical Memorandum
        (TM) 419-92, Washington, DC, 1 Oct 92; Change 1, 4 Nov
        92; Change 2, 5 Aug 94

    g. DSSO, <u>Status of Resources and Training System (SORTS)
        Version 6.0 Database Specification</u>, Database Specifica-
        tion (DS) 1-92, Washington, DC, 18 Sep 92; Change 1, 15
        Sep 94; Change 2, 30 Jun 95

    h. Department of Defense (DoD), <u>Defense System Software
        Quality Program</u>, Department of Defense Standard DoD-STD-
        2168, Washington, DC,
        29 Apr 88

    i. Joint Data Systems Support Center (JDSSC), <u>Status of
        Resources and Training (SORTS) Modernization</u>, Functional
        Description (FD), Washington, DC, 15 May 88 (draft)

    j. JDSSC, <u>Status of Resources and Training System Moderniza-
        tion (SORTS-M) System Specification</u>, System Programmers

Manual (SPM) System Specification (SS) 171-90, Washing-
ton, DC, 18 Jun 90

k. JDSSC, <u>System Design Document for the Status of Resources
and Training System (SORTS) Modernization</u>, System/Segment
Design Document (SSDD) 1-90, Washington, DC, 7 Dec 90
(unpublished)

l. Joint Interoperability Engineering Organization (JIEO),
<u>Common Warfighting Symbology</u>, Version 1, Military Stan-
dard MIL-STD-2525, Reston, VA, 30 Sep 94

m. JIEO, <u>GCCS Common Operating Environment Baseline</u>, Ster-
ling, VA,
28 Nov 94

n. JIEO, <u>Global Command and Control System Integration
Standard</u>, Version 1.0, Sterling, VA, 26 Oct 94

o. JIEO, <u>Global Status of Resources and Training System
(GSORTS) Version 1.0 User's Guide</u>, Sterling, VA, 19 Aug
94; Change 1, 30 Jun 95

p. JIEO, <u>Joint User Handbook for Message Text Formats (JUH-
MTF)</u>, Revision 5.2, JIEO Handbook (JIEOH) 9000, Sterling,
VA, 1 Oct 92

q. JIEO, <u>Status of Resources and Training System (SORTS)
Software Development Plan</u>, Software Development Plan
(SDP) 3-96, Washington, DC, 8 Mar 96

r. JIEO, <u>Software Requirements Specification for the Status
of Resources and Training System (SORTS)</u>, Software Re-
quirements Specification (SRS) 1-96, Washington, DC, 26
Feb 96

s. JIEO, <u>Software Version Description for the Global Status
of Resources and Training System (GSORTS)</u>, Version 2.0,
Software Version Description (SVD) 2-96, Washington, DC,
10 Apr 96

t. JIEO, <u>Software Version Description for the Status of
Resources and Training System (SORTS)</u>, Version 6.2, Soft-
ware Version Description (SVD) 3-96, Washington, DC, 10
Apr 96

u. JIEO, <u>User Interface Specifications for the Global Command and Control System (GCCS)</u>, Version 1.0, Sterling, VA, Oct 94 (draft)

v. Joint Information Service Center (JISC), <u>Computer System Operator's Manual for the Status of Resources and Training System</u>, Computer System Operator's Manual (CSOM) 1-94, Washington, DC, 19 Aug 94; Change 1, 30 Jun 95

w. JISC, <u>Crisis Management ADP System (CMAS) and Global Status of Training and Resources System (GSORTS) Data Connection Implementation Plan</u>, Washington, DC, 16 Dec 93 (unpublished)

x. JISC, <u>Project Metrics Handbook</u>, Procedures Manual (PM) 4-94, Washington, DC, 17 Aug 94

y. JISC, <u>Project Status Reports and Reviews Handbook</u>, Procedures Manual (PM) 86-94, Washington, DC, 28 May 94

z. JISC, <u>SORTS/GSORTS Software Standards and Procedures Manual</u>, Technical Memorandum (TM) 446-94, Washington, DC, 23 Sep 94

aa. Joint Staff (JS), <u>Joint Reporting Structure Status of Resources and Training System (SORTS)</u>, Joint Publication (PUB) 1-03.3, Washington, DC, 10 Aug 93

ab. JS, <u>U.S. Message Text Formatting Program</u>, Joint Publication (PUB) 6-04.20, Washington, DC, 1 Oct 92

ac. Office of the Assistant Secretary of Defense Command, Control, Communications, and Intelligence (ASD(C^3I)), <u>Data Element Standardization Procedures</u>, Department of Defense (DoD) Manual 8320.1-M-1, Washington, DC, Jan 93

ad. Office of the Secretary of Defense (OSD), <u>Configuration Management</u>, Military Standard MIL-STD-973, Washington, DC, 17 Apr 92, Change 1, 1 Dec 92

ae. United States Air Force (USAF), <u>Engineering Management</u>, Military Standard MIL-STD-499A, Washington, DC, 1 May 74

af. USAF, <u>Military Standard Diskette Message File Formats for Defense Messaging</u>, Military Standard MIL–STD–1832, Scott AFB, IL, 15 Mar 91

ag. USAF, <u>Specification Practices</u>, Military Standard MIL-STD-490A, Washington, DC, 4 Jun 85

ah. USAF, <u>Technical Reviews and Audits for Systems, Equipments, and Computer Software</u>, Military Standard MIL-STD-1521B, Washington, DC,
5 Jun 85; Change 1, 19 Dec 85; Change 2, 17 Jul 92

ai. United States Navy (USN), <u>Software Development and Documentation</u>, Military Standard MIL-STD-498, Alexandria, VA, 5 Dec 94

aj. USN, <u>Software Product Specification</u>, Data Item Description (DID)
DI-IPSC-81441, Alexandria, VA, 5 Dec 94.

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SECTION 3. REQUIREMENTS

This section establishes the requirements that another body of
software must meet to be considered a valid copy of the SORTS
Product Baseline (PBL).

3.1 Executable Software

The files needed to install and operate the SORTS applications
are specifically listed in Appendix B of references (s) and (t).

3.2 Source Files

The source code that comprises SORTS is controlled, managed, and
maintained within the DISA SORTS Office (JEXAA) at the Pentagon.
It's stored in an electronic format using the POLYTRON Version
Control System (PVCS).

3.3 Packaging Requirements

The requirements for packaging and marking copies of the software
are as follows:

    a. For the Sun SPARC platforms:

        (1) A copy of the system release in 8mm tape cartridge
            Unix *tar* format that may be loaded and executed on a
            Sun platform in the Solaris 2.3 environment. The
            tape includes executable code, install and post-in-
            stall scripts, example data and files, as well as all
            corollary files needed to execute the release.

        (2) External tape label with the following information:

> **GSORTS v2.0**
> **GSORTS, GORA, GUPD, GWORLD**
> **GSORTSC Segments**
> **4/10/96**
> **Solaris 2.3   1 of 1**
> **Executable   UZZ**

    b. For the Honeywell/Macintosh platforms (commonly known as
        the WIS Workstations or simply WWS):

(1) One 3.5 inch diskette and one 150 megabyte (MB) mag-
    netic tape in Unix *cpio* format that may be loaded and
    executed on a WIS Workstation in the Apple/Unix
    (A/UX) 2.0 Release 3C environment. The two media
    include executable code, installation scripts,
    example data and files, as well as all corollary
    files needed to execute the release.

(2) External tape label with the following information:

      SORTS v6.2 WWS Release
      4/10/96
      A/UX 3C   1 of 1
      **   UZZ**

(3) External disk label with the following information:

      SORTS v6.2 WWS Release
      install.sorts
      4/10/96   1 of 1
      **   UZZ**

SECTION 4. QUALIFICATION PROVISIONS

This section states the methods that should be used to demon-
strate that valid copies of both the executable software and
source files have been provided.

4.1 <u>Executable Files</u>

Each executable file referenced in Section 3.1 has an identically
named counterpart in the software copy provided. Each of those
counterpart files can be compared to the master copy maintained
by the Configuration Management (CM) Section of the DISA SORTS
Office at the Pentagon for: name, file size, and date of
creation.

4.2 <u>Source Files</u>

Source code files are not released with the system release.
However, each source file referenced in Section 3.2 has an
identically named counterpart maintained by the SORTS Office's CM
Section at the Pentagon.

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SECTION 5. SOFTWARE SUPPORT INFORMATION

This section provides critical information needed to provide
SORTS software support.

5.1 "As Built" Software Design

The software design from which SORTS was developed is detailed in
the System Design Document for the Status of Resources and
Training System (SORTS) Modernization (JDSSC SSDD 1-90). This
stand-alone document appears as reference (k) in Section 2. For
additional information on the design, please refer directly to
the SSDD.

5.2 Compilation/Build Procedures

All compilation/build processes utilized by JEXAA to produce a
system release are maintained as written procedural steps (and
documented in the project's Standard Operating Procedures) or as
Unix scripts (stored as tools within the project's PVCS
database).

SORTS software is comprised entirely of ANSI/ISO C language code
that requires the following compilers and Oracle pre-compiler
(Pro*C):

    a. GNU Cygnus [gcc], Version 2.5.90 (for the Solaris
environment)

    b. gcc, Version 1.40 (for the A/UX environment)

    c. Pro*C, Version 1.3.15.1.2 (used in both environments).

5.3 Modification Procedures

All software modifications to SORTS are accomplished by the DISA
SORTS Office (JEXAA). The actual flow of change control is
delineated in the following 16-step process:

    a. *Prepare a Problem Report (PR)* by entering it into the PR
        Database **[the source of the reported problem is
        unimportant and can be from JEXAA analysts, users, an
        external problem report (e.g., GSPR), or Joint Staff
        Memoranda]**.

b. *Validate the PR and review it at the next TRB*.

c. The SORTS Project Manager (PM) *assigns 1 or more validated PRs for ECP analysis*.

d. The developers (Government or contractor) *provide an estimated analysis delivery date* (required within approx. 24 hours).

e. *The analyzed ECP is delivered to the Configuration Management (CM) Section* with cost estimate(s) for each option identified in the technical approach **[schedule estimates are also a goal]**.

f. *The PM assigns Class, Justification, and Priority codes* to the analyzed ECP.

g. *The analyzed ECP is reviewed by the next TRB*:

   (1) Disapproved ECPs are noted in TRB Minutes with reason(s)

   (2) Enhancement ECPs are referred to the CRB for approval

   (3) Approved ECPs are noted in TRB Minutes (cost, option approved, etc).

h. *The PM activates an approved ECP* for implementation.

i. *The developers provide an estimated completion date* (required within approx. 24 hours).

j. *The completed ECP is delivered to the CM Section*.

k. *The CM Section verifies that the delivered ECP is ready for testing*:

   (1) Insures any delivered code was properly checked into PVCS

   (2) Collects cost and size metrics for project metrics database

   (3) Stores the electronic copy of the regression test case(s)

(4) Stores the electronic copy of any delivered
documentation

(5) Uses the delivered ECP Completion Report instructions
to compile the deliverable and place the executable
files into applicable test directories for Government
acceptance testing.

l. *The completed ECP is provided to the Quality Control (QC)
Section*.

m. *The QC Section uses the delivered regression test(s) to
verify that completed ECP functions correctly and any
relevant delivered documentation is accurate*.

n. *The QC Section provides the tested ECP to the CM Section
with a recommendation for acceptance/rejection*:

(1) Rejected ECPs are returned to the developer with
explanation and a requirement for re-delivery **[go
back to Step (i) now]**

(2) Acceptable ECPs are provided to the PM.

o. *The PM reviews the completed ECP*, its test results, and
the recommendations from the QC Section *for acceptance*.

p. *The accepted ECP is returned to the CM Section for
closure* in the CM tracking database and storage into the
Closed ECP binder **[signifies its readiness for inclusion
in the next software release]**.

All necessary software, equipment, facilities, and procedures for
their use is available within JEXAA and its software development
facilities. The Master SORTS database and all necessary data
files are also maintained within and under the control of JEXAA.
All applicable design, coding, and related conventions are
specifically delineated in the project's Software Standards and
Procedures Manual (JISC TM 446-94) which appears as reference (z)
in Section 2.

5.4 Computer Hardware Resource Utilization

Computer hardware resource utilization for this SORTS PBL varies
based on the hardware configuration where the software is loaded.

Measurements appearing in Table 5-1 for both Random Access Memory
(RAM), disk storage requirements, and swap space are in *megabytes
(MB)*.

Table 5-1. SORTS Required Resources

Hardware Platform	Segment	RAM Memory (MB)	Disk Storage (MB)	Swap Space (MB)
Sun (single)	N/A	64	1,656.511	0
Sun (GCCS)	GORA	64	768.663	0
	GUPD	64	82.721	0
	GSORTS	64	15.635	0
	GWORLD	64	789.417	0
	GSORTSC	64	0.075	0
WWS	N/A	16	38.623[1]	16
	N/A	32	38.623[1]	0

[1]***Note: The disk storage values for the WWS do not include the sizing of the Oracle database because the sizing varies from site to site on that particular platform.***

SECTION 6. REQUIREMENTS TRACEABILITY

Traceability between the source files and the software units that
they implement in maintained within the DISA SORTS Office
(JEXAA). At an aggregate level, the file listings referenced in
Section 3.1 are illustrative of the CSCI and Computer Software
Component (CSC) hierarchy of the application. Traceability
between hardware resource utilization measurements and the CSCI
requirements they address is delineated in Section 5.4.

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SECTION 7. NOTES

This section contains general information that aids in understanding this specification. Specifically, an alphabetical listing of terms, acronyms, and abbreviations as used in this specification is provided:

ADP -----------
              Automated Data Processing
AFB -----------
              Air Force Base
ANSI ----------
              American National Standards Institute
ASD(C^{3}I) ------
              Office of the Assistant Secretary of Defense
              Command, Control, Communications, and Intelligence
A/UX ----------
              Apple/Unix; Unix variant on the WIS Workstation
C -------------
              The C programming language as specified by ANSI/ISO
              Standard ANSI/ISO 9899:1992 and FIPS PUB 160
C^2 ------------
              Command and Control
CAI -----------
              Computer-Aided Instruction
CJCS ----------
              Chairman of the Joint Chiefs of Staff
CJCSI ---------
              Chairman of the Joint Chiefs of Staff Instruction
CM ------------
              Configuration Management
CRB -----------
              The SORTS Configuration Review Board chaired by J38
CSC -----------
              Computer Software Component
CSCI ----------
              Computer Software Configuration Item
CSOM ----------
              Computer System Operator's Manual as specified in
              DoD-STD-2167A
DI ------------
              Data Item
DID -----------
              Data Item Description

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DISA ----------
          Defense Information Systems Agency
DoD -----------
          Department of Defense
DoD-STD -------
          Department of Defense Standard
DS -----------
          Database Specification as described in DoD-STD-
          7935A
DSSO ----------
          Defense Systems Support Organization; forerunner of
          JISC
FD -----------
          Functional Description as specified by DID #
          DI-IPSC-80689 of DOD-STD-7935A
FIPS PUB ------
          Federal Information Processing Standards
          Publication
ECP -----------
          Engineering Change Proposal
gcc -----------
          GNU (ANSI) C Compiler
GCCS ----------
          Global Command and Control System; successor to
          WWMCCS
GSORTS --------
          Global SORTS
GSPR ----------
          GCCS Software Problem Report (DISA Form 291)
IPSC ----------
          Information Processing Standards for Computers
ISO -----------
          International Standards Organization
JDSSC ---------
          Joint Data Systems Support Center; forerunner to
DSSO
JEX -----------
          JIEO's Center for Computer Systems Engineering
          (Bailey's Crossroads, VA)
JEXA ----------
          JEX's Applications Engineering Facility
JEXAA ---------
          The DISA SORTS Office (located at the Pentagon)
JIEO ----------
          DISA's Joint Interoperability Engineering
          Organization
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JIEOH ---------
            JIEO Handbook
JISC ----------
            Joint Information Service Center; now de-
            established and all software development functions
            were transferred to JIEO's Center for Computer
            Systems Engineering (JEX) in October 1994
Joint PUB -----
            Joint Staff Publication
JS -----------
            Joint Staff
JUH -----------
            Joint User Handbook
J38 -----------
            The J3's Readiness Division and Functional Manager
            for SORTS
MB -----------
            Megabyte; 1,048,576 bytes of information
MIL-STD -------
            Military Standard
MOP -----------
            Memorandum of Policy
MTF -----------
            Message Text Format; refers to the U.S. Message
            Text Format
NCA -----------
            National Command Authorities
NMCS ----------
            National Military Command System
OSD -----------
            Office of the Secretary of Defense
PBL -----------
            Product Baseline; fielded configuration of software
            as specified by MIL-STD-490A
PM -----------
            Procedures Manual as specified by DSSO PM 1-91;
            also used to designate Project Manager
PR -----------
            Problem Report used by JEXAA to track software
            problems
Pro*C ---------
            Oracle pre-compiler used for the programmatic
            interface between SORTS C code modules and the
            Oracle RDBMS
PUB -----------
            Publication
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PVCS ----------
            POLYTRON Version Control System; commercial product
            used by the DISA SORTS Office to support CM efforts
QC ------------
            Quality Control
RAM -----------
            Random Access Memory
RDBMS ---------
            Relational Database Management System (e.g.,
            Oracle)
Solaris -------
            The operating system environment of the Sun family
            of Unix workstations and servers; Solaris 2.3 is
            the current operating system version and is
            equivalent to SunOS 5.3
SORTS ---------
            Status of Resources and Training System
SORTS-M -------
            Modernized SORTS
SPARC ---------
            Scalable Processing Architecture
SPM -----------
            System Programmer Manual
SPS -----------
            Software Product Specification as specified by DID
            #
            DI-IPSC-81441 of MIL-STD-498
SS -----------
            System/Subsystem Specification as described in DoD-
            STD-7935A
SSDD ----------
            System/Subsystem Design Document as described in
            DoD-STD-2167A
Sun -----------
            Workstation used as development and operational
            support platform for SORTS in the GCCS environment
SunOS ---------
            Sun Operating System; V5.3 is equivalent to Solaris
            2.3
SVD -----------
            Software Version Description as specified by DID #
            DI-IPSC-81442 of MIL-STD-498
TM ------------
            Technical Memorandum as specified by DSSO PM 1-91
TRB -----------
            The SORTS Technical Review Board chaired by JEXAA

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Unix ----------
          A multi-tasking operation system that runs on a
          wide variety of computer systems from micro to
          mainframe
USAF ----------
          United States Air Force
USN -----------
          United States Navy
WIS -----------
          WWMCCS Information Systems
WWMCCS --------
          Worldwide Military Command and Control System
WWS -----------
          WIS Workstation; refers to the Apple/Macintosh IIfx
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